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| 10/578,228 | 05/04/2006 | Masaru Taniguchi | 0670-7074 | 1948 |
| 31780 | 7590 | 06/24/2009 | | |
| ERIC ROBINSON | | | EXAMINER | |
| PMB 955 | | | SINGH, HIRDEPAL | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/578,228 | Applicant(s) TANIGUCHI, MASARU |
| | Examiner HIRDEPAL SINGH | Art Unit 2611 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 08 December 2008.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 11 is/are allowed.

6) Claim(s) 1-3,9 and 10 is/are rejected.

7) Claim(s) 4-8 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 04 May 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 5/4/06, 9/21/06

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application

6) Other: _____

DETAILED ACTION

1. This action is in response to the preliminary amendment filed on December 08, 2008. Claims 1-11 are pending and have been considered below.

Specification

2. The disclosure is objected to because of the following informalities: In the present application specification page 9, lines 14-16 describe "...it is extremely difficult to make a mounting space and cost of a nonlinear power amplifier equivalent to those of the non-linear power amplifier..." it is suggested to make clear whether, mounting space and cost of nonlinear power amplifier is difficult to make equivalent to linear power amplifier or vice versa.

Appropriate correction is required.

Claim Objections

3. Claims 4-8 are objected to because of the following informalities: the claims in a patent application are supposed to have limitations separated by semicolons, In claim 4, it is suggested to modify the wording in lines 4-6 to recite the elements included in transmitter separate than the receiver. Also insert a semicolon at end of lines 5 and 15.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodworth (US 2003/0194017) in view of Kaku (US 2007/0009061).

Regarding claims 1 and 9:

Woodworth discloses a modulating apparatus in a mobile communication system that performs data communication at a rate for transmitting 2400 symbols per second, each of the symbols having multi-level, characterized by comprising:

a base band filter that blocks an unnecessary frequency component (abstract) of a multi-level symbol inputted and outputs a waveform signal (paragraph 0017, filtering out the signal to produce waveform); and

frequency shifting and modulating means (28 in figure 4; paragraph 0052) for shifting to modulate a frequency of an output signal according to a magnitude of an amplitude of the waveform signal inputted from the base band filter (paragraphs 0037, 0049, receiving signal to modulate magnitude).

Woodworth discloses all of the subject matter as described above and further discloses that the frequency shifting and modulating means is adjusted such that, when, a positive symbol and a negative symbol (paragraphs 0010, 0021 and 0039) with their maximum values are modulated the range of frequencies and the bandwidth for

transmission increases (paragraphs 0038, 0043 and 0048), except for specifically teaching that the symbols are repeatedly inputted an output signal has an absolute value of a frequency shift in a range of 0.822[kHz] to 0.952[kHz].

However, Kaku in the same field of endeavor discloses a system and method for data transmission where the system as known, shifts the frequency in the range between 0 to 96 KHz (paragraph 0025) that include the described range.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Kaku in Woodworth to shift the frequency of the modulation signal in the described range for data transmission in required channels with channel spacing without introducing noise and affecting throughput by changing the symbol to transmitting data with the stable performance of system and improved signal to noise ratio characteristics.

Regarding claims 2 and 10:

Woodworth discloses a modulating apparatus in a mobile communication system that performs data communication at a transmission rate of $2400x(n+1)$ (n : natural number) [bps], characterized by comprising:

symbol converting means for sequentially converting (paragraphs 0010 and 0043) a binary signal generated by encoding predetermined data into a $2^{(n+l)}$ -ary symbol (paragraphs 0006, 0012 and 0043), which includes $(2^{(n+l)+1}-2^k)$ ($1 \leq k \leq 2^{(n+l)}$) values, ($n+l$) bits at a time and outputting the symbol;

a base band filter that blocks an unnecessary frequency component (abstract) of a symbol inputted from the symbol converting means and outputs a waveform (paragraph 0017, filtering out the signal to produce waveform) signal; and

frequency shifting and modulating means (28 in figure 4; paragraph 0052) for shifting to modulate a frequency of an output signal according to a magnitude of an amplitude of the waveform signal inputted from the base band filter (paragraphs 0037, 0049, receiving signal to modulate magnitude).

Woodworth discloses all of the subject matter as described above and further discloses that the frequency shifting and modulating means is adjusted such that, when, a positive symbol and a negative symbol (paragraphs 0010, 0021 and 0039) with their maximum values are modulated the range of frequencies and the bandwidth for transmission increases (paragraphs 0038, 0043 and 0048), except for specifically teaching that the symbols are repeatedly inputted an output signal has an absolute value of a frequency shift in a range of 0.822[kHz] to 0.952[kHz].

However, Kaku in the same field of endeavor discloses a system and method for data transmission where the system as known, shifts the frequency in the range between 0 to 96 KHz (paragraph 0025) that include the described range.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Kaku in Woodworth to shift the frequency of the modulation signal in the described range for data transmission in required channels with channel spacing without introducing noise and affecting throughput by changing the

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symbol to transmitting data with the stable performance of system and improved signal to noise ratio characteristics.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woodworth (US 2003/0194017) in view of Kaku (US 2007/0009061) as applied to claims 1 and 2 above, and further in view of Choi et al. (US 7,256,,839).

Regarding claim 3:

Woodworth discloses all of the subject matter as described above except for specifically teaching that the base band filter is a Nyquist filter.

However, Choi in the same field of endeavor discloses a system and method for data communication where the system as known, eliminates half of the spectrum with Nyquist filter (column 4, lines 4-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Choi in Woodworth to have the modulation done at the Nyquist rate for achieving the signal satisfactorily at the receiving end with minimal loss of information and improve the system performance.

Allowable Subject Matter

7. Claims 4-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim 11 is allowable over the prior art.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record discloses a system and method for modulating multilevel signal, but fails to disclose that the system includes demodulating means for demodulating the signal transmitted from the transmitter and received and outputting a $2(n+l)$ ary signal with another or second base band filter that blocks an unnecessary frequency component of the $2(n^l)$ -ary signal outputted from demodulating means and outputs the $2(n+l)$ -ary signal binary signal converting means for sequentially converting a $2(n^{\sim})$ -ary signal inputted from the second base band filter into a binary signal of $(n+l)$ bits and outputting the binary signal where decoding a binary signal and outputting the predetermined data when given symbols are alternately repeated.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Noda (US 2003/0189986) a modulation system and method for modulating a multi-level signal.
- b. Lindh (US 2004/0101062) a system and method for transmitting signal with baseband filtering and frequency modulation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRDEPAL SINGH whose telephone number is (571)

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270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off)

8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. S./

Examiner, Art Unit 2611

/Shuwang Liu/

Supervisory Patent Examiner, Art Unit 2611